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EXAMINER				
SUCH, MATTHEW W				
ART UNIT		PAPER NUMBER		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/550,653

Applicant(s)

NODA ET AL.

Examiner

MATTHEW W. SUCH

Art Unit

2891

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 November 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/CG-706)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date 1/17/2006 & 10/10/2008

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on 25 March 2003. It is noted, however, that applicant has not filed a certified copy of the 2003-083375 application as required by 35 U.S.C. 119(b).

Information Disclosure Statement

2. The information disclosure statements (IDS) submitted on 17 January 2006 and 10 October 2008 are being considered by the examiner.

Drawings

3. The drawings were received on 15 November 2006. These drawings are acceptable.

Specification

4. The disclosure is objected to because of the following informalities: the phrase "Therefore,the" on Page 2, Line 9 should read "Therefore, the"; the phrase "the the" on Page 10, Line 27 should read "the"; the word "fablicate" on Page 44, Line 11 should read "fabricate"; the word "deposition" on Page 49, Line 6 should read "deposition"; the word "sexithionphene" on Page 68, Line 14 should read "sexithiophene"; the word "oligopheylenevinilene" on Page 68, Line 15 should read "oligophenylenevinylene"; the work "poly(phenylenevinilene)" on Page 68, Line 18 should read "poly(phenylenevinylene)"; the word "poly(thienylenevinilene)" on Page 68,

Line 18 should read "poly(thienylenevinylene)"; the word "polyvinylcarbozole" on Page 68, Line 20 should read "polyvinylcarbazole"; the word "PMA" on Page 69, Line 23 should read "PMMA"; the word "tricetate" on Page 69, Line 24 should read "triacetate"; the phrase "triacethyl ceollulose" on Page 69, Line 26 should read "triacetyl cellulose".

Appropriate correction is required.

Claim Objections

5. Claim 1 is objected to because of the following informalities: the number of the claim which reads "1," should read "1.". Appropriate correction is required.
6. Claim 4 is objected to because of the following informalities: the word "comrpised" in Line 3 of the claim should read "comprised". Appropriate correction is required.
7. Claim 7 is objected to because of the following informalities: the word "comrpised" in Line 3 of the claim should read "comprised". Appropriate correction is required.
8. Claim 8 is objected to because of the following informalities: the claim must being on a new line. Appropriate correction is required.
9. Claim 23 is objected to because of the following informalities: the word "ot" in Line 3 of the claim should read "to". Appropriate correction is required.

Claim Rejections - 35 USC § 112

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claims 1-34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims recite the limitations "the interior", "the exterior", "the boundary", and "the outer surface" in several locations of the claims. There is insufficient antecedent basis for this limitation in these claims. Additionally, the recitations of "the interior", "the exterior", "the boundary", and "the outer surface" further render the claims indefinite because it is unclear what is considered "the interior", "the exterior", "the boundary", and "the outer surface".

Additionally, the claims recite that the device comprises "at least" followed by a listing of several limitations. The inclusion of the phrase "at least" in this context renders the claim indefinite because it is unclear if the claims include more than what is explicitly recited and if so, what else is included.

12. Claims 3, 6, 8, 10-11 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims recite "in that order". However, this recitation renders the claims indefinite because it is unclear what "that" is.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. In so far as definite, claims 1-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Kimura ('713).

Claim interpretations: The examiner notes that claims 1-13 use the phrase "means for" in an attempt to invoke an interpretation under 35 U.S.C. 112, sixth paragraph. However, claims 14-34 fail to properly invoke an interpretation under 35 U.S.C. 112, sixth paragraph because (i) the claims fails to use the phrase "means for" (instead, see claim 14 which uses the phrase "means") and (ii) the means for is modified by sufficient structure (see the phrase "the mode conversion means is an optical structure...", which is an modification by structure). The examiner also notes that all of the claims fail to recite that claimed device actually comprises the mode conversion means for. Instead the claims recites "wherein a mode conversion means for...is arranged...". For example, claim 1 recites "A light-emitting device comprising at least a light-emitting layer on a substrate, wherein a mode conversion means for...". In this claim, the only limitations which actually comprise the scope of the claimed device is "at least a light-emitting layer on a substrate". Language that suggests or makes optional but does not require steps to be performed or does not limit a claim to a particular structure does not limit the scope

of a claim or claim limitation. A "wherein" clause is language that raises question as to the limiting effect of the language in a claim. See MPEP § 2106 II C and MPEP § 2111.04. While prior art that does not include a "mode conversion means for" would therefore read on the claims as long as the actually recited claim limitations are met, for the purposes of compact prosecution, the examiner provides art which anticipates the claims with the "mode conversion means for". If the Applicant wishes that the claims actually comprise the "mode conversion means for", the Applicant should amend the claims with language to properly ensure that the claimed device actually comprises the "mode conversion means for".

- a. Regarding claim 1, Kimura teaches a light emitting device comprising at least one light emitting layer (Elements 104, 309, 508, 606, 705, 804) on a substrate (Elements 101, 301, 501, 601, 701, 801). A mode conversion means for (surface of Elements 108, 302, 514, 609, 702, 810) converting a waveguide mode is on a surface of the substrate opposite to the light emitting layer, for example.
- b. Regarding claim 2, Kimura teaches a light emitting device comprising at least one light emitting layer (Elements 104, 309, 508, 606, 705, 804) and a waveguide layer (see interlayer dielectric in Figs. 1, 3, 5-8 or the material of Elements 108, 302, 514, 609, 702, 810) on a substrate (Elements 101, 301, 501, 601, 701, 801). A mode conversion means for (surface of Elements 108, 302, 514, 609, 702, 810) converting a waveguide mode is on a surface of the substrate opposite to the light emitting layer, for example.

- c. Regarding claim 3, Kimura teaches a light emitting device comprising a first electrode (Elements 103, 305, 306, 504, 505, 604, 703, 802), an organic EL layer (Elements 104, 309, 508, 606, 705, 804) and a second electrode (Elements 105, 311, 510, 607, 707, 806) opposed to the first electrode arranged in "that" order on a substrate (Elements 101, 301, 501, 601, 701, 801). A mode conversion means for (surface of Elements 108, 302, 514, 609, 702, 810) converting a waveguide mode is on a surface of the substrate opposite to the light emitting layer (the "exterior"), for example.
- d. Regarding claim 4, Kimura teaches that the second electrode is a thin film metal electrode (Element 105, 311, 607, 707; Para. 0055, 0080), for example.
- e. Regarding claim 5, Kimura teaches an optical function layer (material of material of Elements 108, 302, 514, 609, 702, 810) having the mode conversion means for converting the waveguide mode (surface of Elements 108, 302, 514, 609, 702, 810) on a surface of the substrate opposite to the light emitting layer (the "outer surface"), for example.
- f. Regarding claim 6, Kimura teaches a light emitting device comprising a first electrode (Elements 103, 305, 306, 504, 505, 604, 703, 802), an organic EL layer (Elements 104, 309, 508, 606, 705, 804) and a second electrode (Elements 105, 311, 510, 607, 707, 806) opposed to the first electrode arranged in "that" order on a substrate (Elements 101, 301, 501, 601, 701, 801). A waveguide layer (see interlayer dielectric in

Figs. 1, 3, 5-8 or the material of Elements 108, 302, 514, 609, 702, 810). A mode conversion means for (surface of Elements 108, 302, 514, 609, 702, 810) converting a waveguide mode is on a surface of the substrate opposite to the light emitting layer (the "exterior"), for example.

g. Regarding claim 7, Kimura teaches that the second electrode is a thin film metal electrode (Element 105, 311, 607, 707; Para. 0055, 0080), for example.

h. Regarding claim 8, Kimura teaches an organic EL light emitting device comprising at least a first electrode (Elements 504, 505, 604, 802), an organic EL layer (Elements 508, 606, 804), a translucent second electrode (Elements 510, 607, 707) opposed to the first electrode and a protective film (Elements 511, 512, 513, 608, 610, 611, 807, 808, 809) arranged in "that" order on a substrate (Elements 501, 601, 801). A mode conversion means (surface of Elements 514, 609, 810) for converting a waveguide mode to a radiation mode is arranged on a surface of the protective film oppose of the EL layer ("the boundary between the protective film and the exterior of the protective film"), for example.

i. Regarding claim 9, Kimura teaches an optical function layer (material of Elements 514, 609, 810) having the mode conversion means for converting the waveguide mode to the radiation mode on the outer surface of the protective film.

j. Regarding claim 10, Kimura teaches an organic EL light emitting device comprising at least a first electrode (Elements 504, 505, 604, 802), an organic EL layer (Elements 508, 606, 804), a translucent second electrode (Elements 510, 607, 707) opposed to the first electrode and a protective film (Elements 511, 512, 513, 608, 610, 611, 807, 808, 809) arranged in "that" order on a substrate (Elements 501, 601, 801). A waveguide layer (material of Elements 514, 609, 810) having the mode conversion means for converting the waveguide mode to the radiation mode on the outer surface of the protective film. A mode conversion means (surface of Elements 514, 609, 810) for converting a waveguide mode to a radiation mode is arranged on a surface of the protective film oppose of the EL layer ("the boundary between the protective film and the exterior of the protective film"), for example.

k. Regarding claim 11, Kimura teaches an organic EL light-emitting device comprising at least a transparent electrode (Elements 103, 305, 306, 604, 703; Para. 0023, 0053, 0076), an organic EL layer (Elements 104, 309, 606, 705), and a metal electrode (Elements 105, 311, 607, 707; Para. 0055, 0080) opposed to the transparent electrode arranged in "that" order on a transparent substrate (Elements 101, 301, 601, 701; Para. 0027, 0041, 0074). A mode conversion means for (surface of Elements 108, 302, 609, 702) converting a waveguide mode is on a surface of the substrate opposite to the light emitting layer (the "exterior"), for example.

- l. Regarding claim 12, Kimura teaches an optical function layer (material of Elements 108, 302, 609, 702) having the mode conversion means for converting the waveguide mode to the radiation mode on the outer surface of the protective film.
- m. Regarding claim 13, Kimura teaches an organic EL light-emitting device comprising at least a transparent electrode (Elements 103, 305, 306, 604, 703; Para. 0023, 0053, 0076), an organic EL layer (Elements 104, 309, 606, 705), and a metal electrode (Elements 105, 311, 607, 707; Para. 0055, 0080) opposed to the transparent electrode arranged in "that" order on a transparent substrate (Elements 101, 301, 601, 701; Para. 0027, 0041, 0074). A waveguide layer (material of Elements 108, 302, 609, 702) is formed on the transparent substrate and a mode conversion means for (surface of Elements 108, 302, 609, 702) converting a waveguide mode is on a surface of the substrate opposite to the light emitting layer (the "exterior"), for example.
- n. Regarding claim 14, Kimura teaches that the mode conversion means is an optical structure having a regularity of a refractive index distributions in a one-, two-, or three dimensional direction.
- o. Regarding claim 15, Kimura teaches that the regularity is a period of an effective wavelength degree of the light emitted from the organic EL layer, since the claim does not limit what is effective and what is not effective.

p. Regarding claim 16, Kimura teaches more than two mode conversion means having the regularity of the same period (see repeated structures in Figs. 1, 3 and 5-8).

q. Regarding claim 17, Kimura teaches that the regularity has a fluctuation of not more than one fourth of the period of an effective wavelength degree of the light emitted from the organic EL layer since the claim fails to limit the wavelength of light emitted and to what degree it is effective.

r. Regarding claim 18, Kimura teaches that the mode conversion means has at least two optical structures (see repeated structures in Figs. 1, 3 and 5-8) with the regularity of the refractive index distribution in the two-dimensional direction, and the regularity of the optical structures has a different period within the fluctuation range for each optical structure (see Figure 1, for example).

s. Regarding claim 19, Kimura teaches that the two or more optical structures are formed in the same two-dimensional plane (see Figs. 1, 3, and 5-8).

t. Regarding claim 20, Kimura teaches that a period of an effective wavelength degree of the light emitted from the organic EL layer coexists with a fluctuation of not more than one fourth of the period of the effective wavelength degree since the claim fails to limit the wavelength of light emitted and to what degree it is effective.

- u. Regarding claim 21, Kimura teaches that the period of regularity changes gradually (see Fig. 4C, for example).
- v. Regarding claim 22, Kimura teaches that the regularity of the refractive index distribution in the two-dimensional direction an arrangement which can fill up a plane with a finite number of unit elements (see Figs. 1, 3 and 5-8).
- w. Regarding claim 23, Kimura teaches that the regularity of the refractive index distribution is formed of a material having a higher refractive index than a material lacking the regularity to the refractive index distribution since the claim fails to limit what "a material lacking the regularity to the refractive index distribution" is, so it can be, for example, air (see Fig. 4A).
- x. Regarding claim 24, Kimura teaches that the material having a high refractive index is transparent to the light emitted from the organic EL layer (see Fig. 4).
- y. Regarding claim 25, Kimura teaches that the regularity of the refractive index distribution is formed of a material having a lower refractive index than a material lacking the regularity of the refractive index distribution since the claim fails to limit what "a material lacking the regularity to the refractive index distribution" is, so it can be, for example, air (see Fig. 4A).

- z. Regarding claim 26, Kimura teaches that the material having a low refractive index is transparent to the light emitted from the organic EL layer (see Fig. 4).
- aa. Regarding claim 27, Kimura teaches that the material having a low refractive index is a gas, such as air (see Fig. 4).
- bb. Regarding claim 28, Kimura teaches that the gas is air (see Fig. 4).
- cc. Regarding claim 29, Kimura teaches that the boundary is between the substrate and the exterior of the substrate, for example.
- dd. Regarding claim 30, Kimura teaches that the boundary is between the substrate and the exterior of the substrate, for example, and has an unevenness in a two-dimension direction, for example (see Figs. 1, 3 and 5-8).
- ee. Regarding claim 31, Kimura teaches that the boundary between the transparent substrate and the exterior of the transparent substrate, for example, and has an unevenness in a two-dimension direction, for example (see Figs. 1, 3 and 5-8).
- ff. Regarding claim 32, Kimura teaches that the boundary between the transparent substrate and the exterior of the transparent substrate (see Figs. 1, 3 and 5-8).

gg. Regarding claim 33, Kimura teaches that the organic EL layer has a different wavelength emitted light wavelength depending on the area, since the claim does not limit how it depends on the area, so the different colored pixels of Kimura meet the claim.

hh. Regarding claim 34, Kimura teaches that the conversion means is the optical structure having the regularity of the refractive index distribution in the one-dimensional, two-dimensional or three-dimensional direction corresponding to the different emitted light wavelength since the claim does not limit how they correspond.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Sugiura ('980) and Hamano ('192 and '667) each teach various mode conversion configurations for organic EL light emitting devices.

Contact Information

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW W. SUCH whose telephone number is (571)272-8895. The examiner can normally be reached on Monday - Friday 9AM-5PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kiesha Bryant can be reached on (571) 272-1844. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Matthew W. Such/
Examiner, Art Unit 2891